

Monthly water situation report: Midlands

1 Summary - October 2024

Please see Section 7.3 for a map detailing the Midlands regional coverage of this report.

Rainfall - During October, the majority of hydrological catchments in the Midlands received normal rainfall totals, ranging from 96% to 173% of the long term average (LTA).

Soil moisture deficit - By the end of October, soil moisture deficit (SMD) has stayed the same as of September across the majority of the Midlands area. Compared to the LTA, the majority of soils in October are wetter than expected for the time of year.

River flows - In October, 9 flow monitoring sites recorded exceptionally high monthly mean flows compared to the LTA. A further 6 recorded notably high and 5 recorded above normal monthly mean flows relative to the LTA. One site, Wedderburn Bridge, had no suitable data for October as well.

Groundwater levels - As of the end of October, 5 groundwater monitoring sites recorded exceptionally high groundwater levels compared to the LTA. One site each recorded notably high, above normal and normal groundwater levels compared to the LTA.

Reservoir stocks - As of the end of October, all of the Midlands reservoirs recorded above average storage for the time of year. Since September, storage levels for the majority of reservoirs have increased.

1.1 Rainfall

During October, the majority of Midlands' hydrological catchments received normal rainfall totals, ranging from 96% to 145% of the LTA. The Mid and Lower Severn and Lower Wye situated in the south-west of the Midlands were the only catchments receiving above normal rainfall totals of 153%, 165% and 173% respectively of the LTA.

During the last 3 months, hydrological catchments in the Midlands received a variable amount of rainfall relative to the LTA. Three hydrological catchments, the Lower Severn Estuary, the Lower Wye, and the Soar received exceptionally high rainfall totals of 170%, 163%, and 161% respectively of the LTA. Two hydrological catchments received notably high rainfall totals compared to the LTA. These were the Shropshire Plains in the north-west of the Midlands and the Avon in the east of the Midlands. A further 3 hydrological catchments received above normal rainfall totals ranging from 130% to 143% of the LTA. These were the Mid Severn, Upper Trent, and Tame. The rest of the Midlands received normal rainfall totals relative to the

LTA. These were the Welsh Mountains in the west and the Lower Trent, Derwent and Dove in the east of the Midlands.

Over the past 6 months, 2 hydrological catchments received notably high rainfall totals relative to the LTA. These were the Lower Severn in the south and Shropshire Plains in the north-west of the Midlands. A further 4 catchments received normal rainfall totals relative to the LTA. These were the Welsh Mountains in the west and the Lower Trent, Derwent and Dove in the east of the Midlands. The remaining hydrological catchments in the Midlands received above normal rainfall totals, ranging from 124% to 133% of the LTA.

Over the last 12 months, all of the Midlands hydrological catchments received exceptionally high rainfall totals relative to the LTA. These rainfall totals ranged from 127% to 152% of the LTA.

1.2 Soil moisture deficit and recharge

By the end of October, SMD has stayed the same as that of September for almost all of the Midlands with only a small part of the Lower Trent catchment getting wetter meaning SMD has decreased. By the end of the month, the majority of the Midlands had a SMD of less than or equal to 10mm, meaning soils are saturated.

Compared to the LTA, the majority of soils in October are wetter than expected for the time of year. Only a small area in the north-west of the Midlands had a -5mm to 5mm difference from the LTA. This means that SMD was as expected in this area for the time of year.

1.3 River flows

In October, 9 flow monitoring sites in the Midlands recorded exceptionally high monthly mean flows ranging from 219% to 393% of the LTA. These were Redbrook, Ebley, Evesham, Stareton, Bewdley, Tenbury, Walcot, Deerhurst, and Kegworth. Six monitoring sites recorded notably high monthly mean flows ranging from 159% to 320% of the LTA. These were Butts Bridge, Yoxall, Great Bridgeford, North Muskham, Worksop, and Auckley. Five out of the 6 remaining sites recorded above normal monthly mean flows ranging from 124% to 206% of the LTA.

After the intense rainfall in September, the investigation into the data from Wedderburn Bridge has continued. As a result, we have no suitable data available from this site for October as well. Also, Haw Bridge data is used as a substitute for the Deerhurst site as the data from Deerhurst was not suitable.

1.4 Groundwater levels

As of the end of October, groundwater levels recorded at monitoring sites were normal or above compared to the LTA. Coxmoor, Rider Point, Weir Farm, Four Crosses, and Anthony's Cross recorded exceptionally high groundwater levels compared to the LTA. Southard Lane

and Crossley Hill in the north and Ram Hall in central Midlands recorded normal, notably high, and above normal groundwater levels respectively relative to the LTA.

1.5 Reservoir stocks

As of the end of October, all of the Midlands reservoirs recorded above average storage for the time of year.

Since September, storage levels for the majority of reservoirs have increased. Storage levels for Clywedog, Vyrnwy, and Dove have decreased.

1.6 River Severn operations

The River Severn is regulated to maintain a minimum flow at Bewdley gauging station. This ensures sufficient water flows along the river to support environmental and water supply requirements. Regulation is instigated when flows drop below a threshold. The 2024 regulation season has seen only 7 days of river regulation, which commenced on 28 June 2024. The last day of regulation was 9 September 2024.

1.7 River Wye operations

For all of October, storage in the Elan Valley reservoirs were above the release control line and the flows at Redbrook gauging station were above the regulation threshold.

As of 1 November 2024, storage in the Elan Valley reservoirs are above the release control line and the flows at Redbrook gauging station are above the regulation threshold. Therefore, regulation releases are not in operation.

1.8 Water abstraction restrictions

As of 1 November 2024, there are no water abstraction licence restrictions in place across the Midlands.

Author: Midlands Hydrology, midlandshydrology@environment-agency.gov.uk

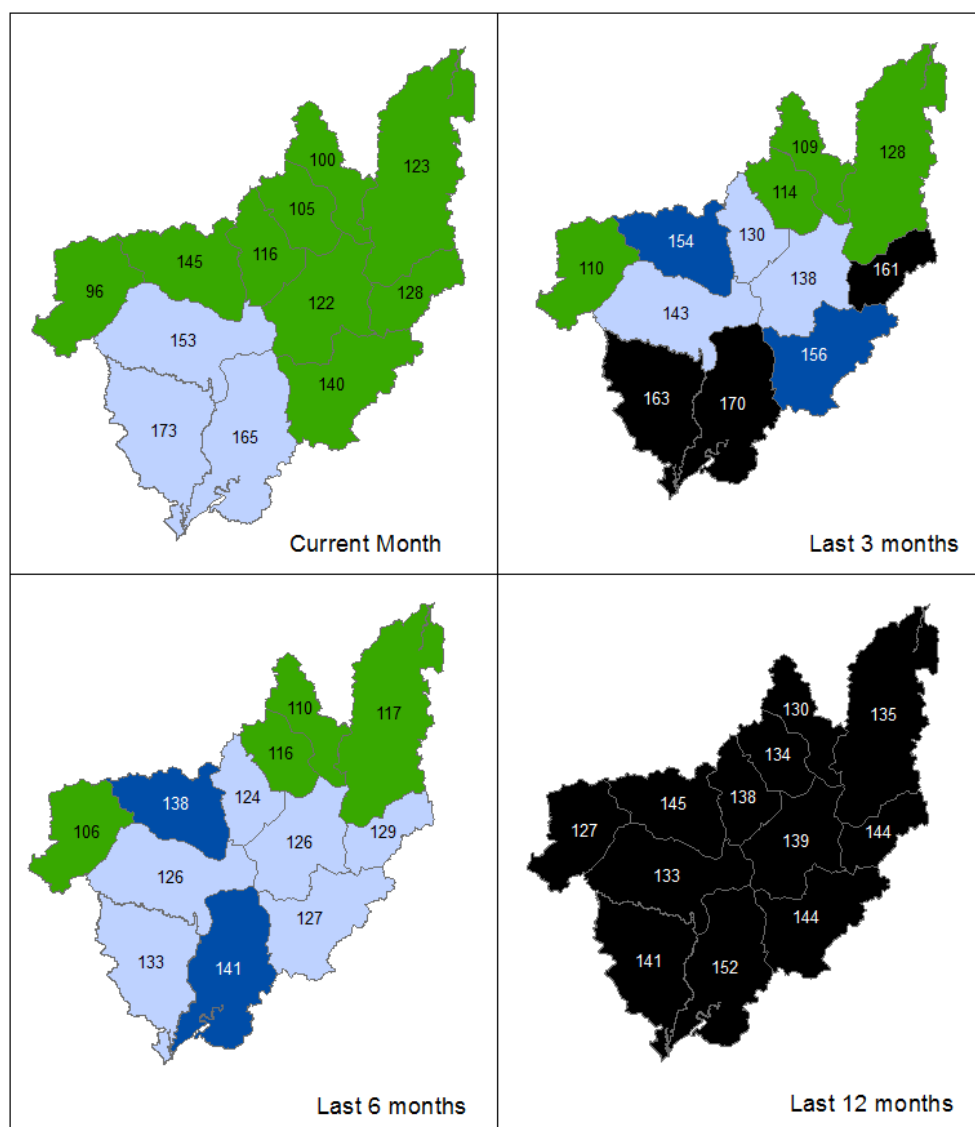
Contact Details: 03708 506 506

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2 Rainfall

2.1 Rainfall map

Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 October 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information. Please see Section 7.4 for a map of the hydrological catchments for which rainfall is reported on.



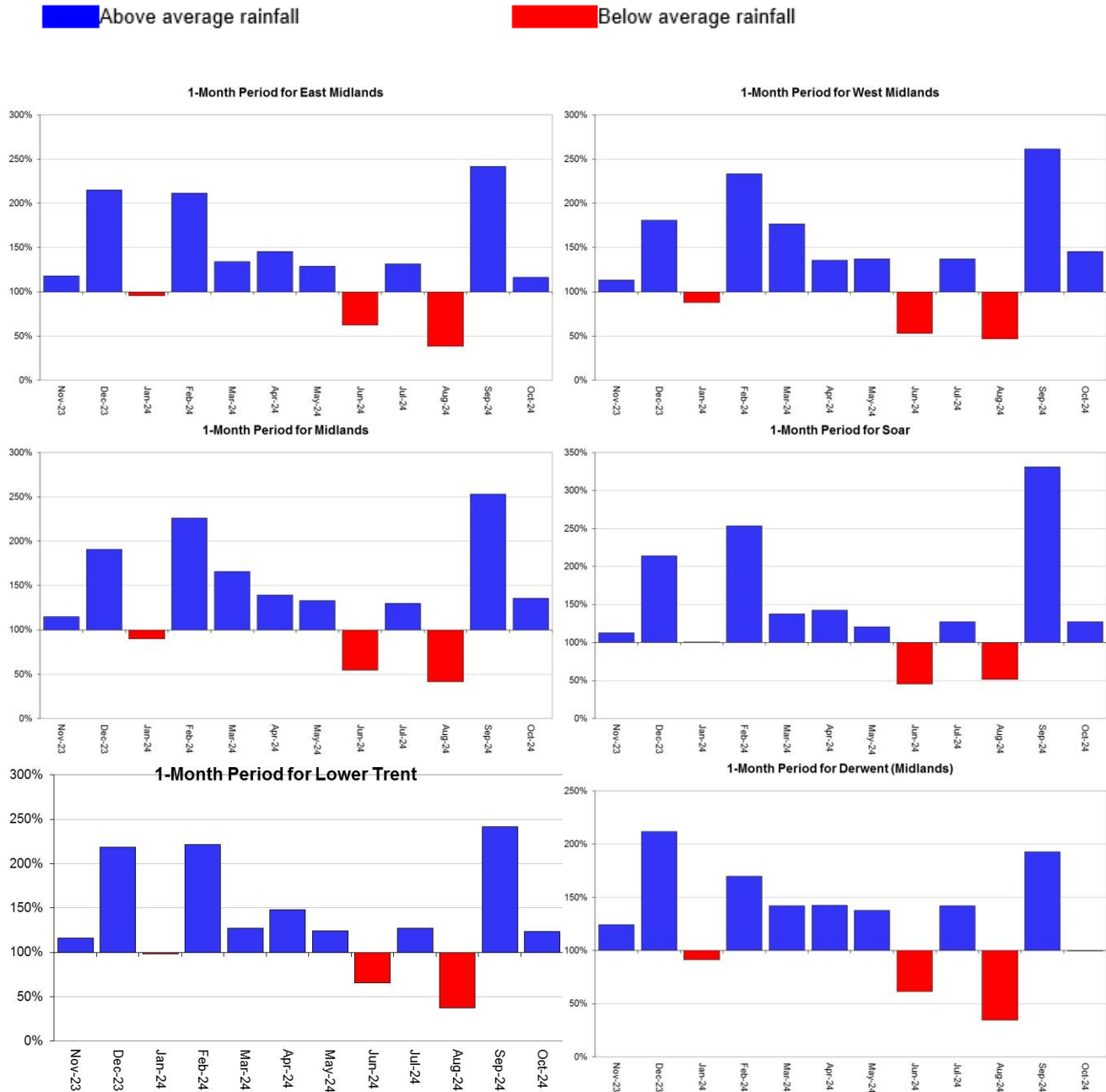
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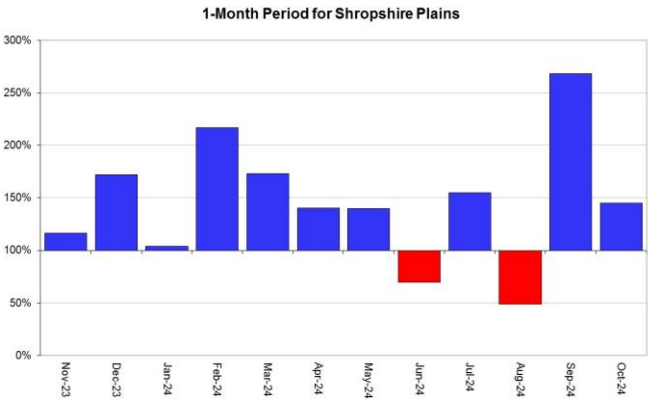
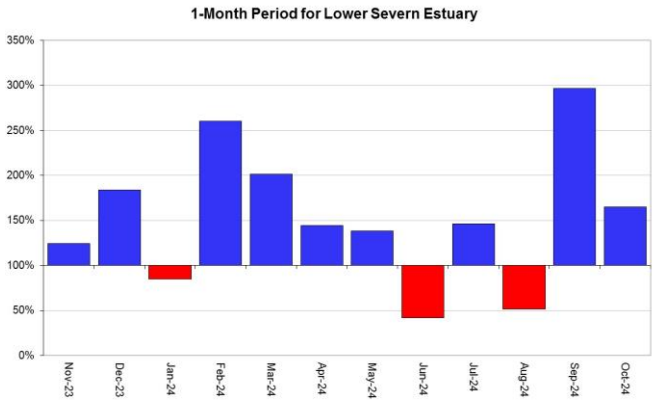
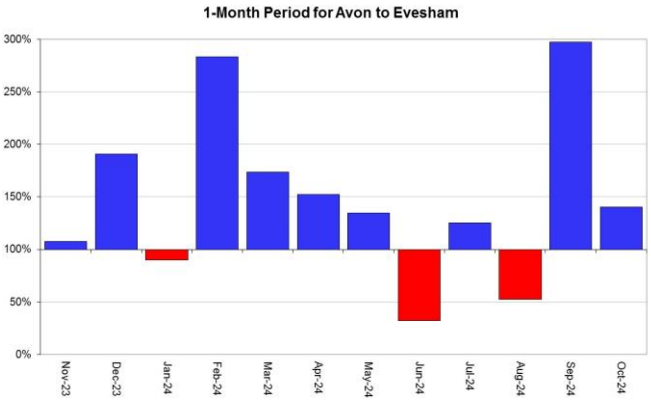
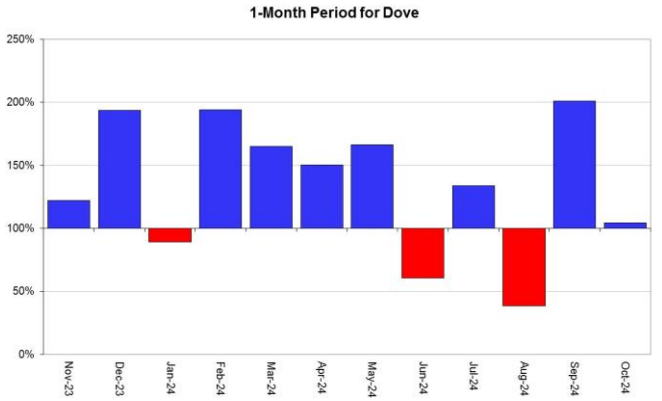
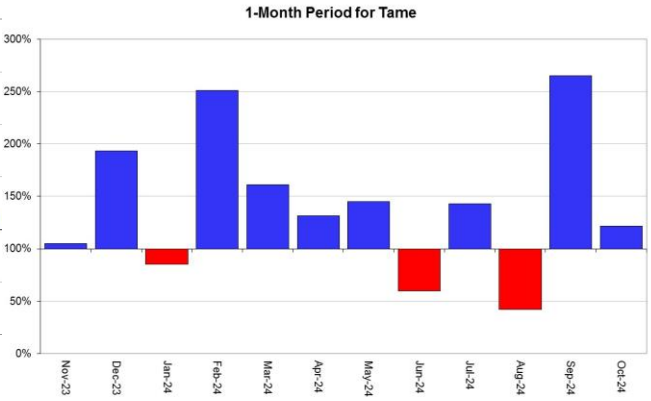
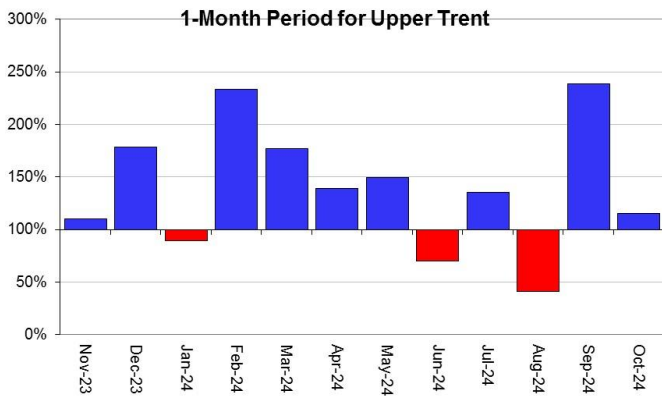
- Exceptionally high
- Above normal
- Below normal
- Exceptionally low
- Notably high
- Normal
- Notably low

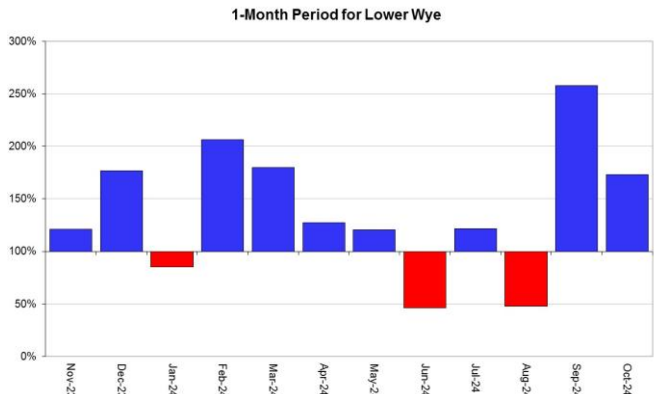
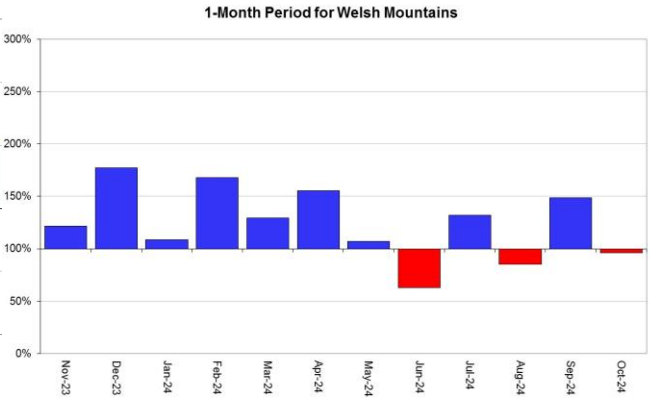
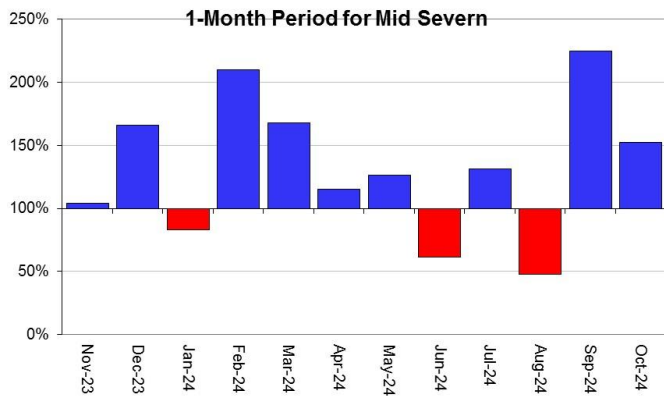
Rainfall data for 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2024).

2.2 Rainfall charts

Figure 2.2: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for hydrological areas across the Midlands region.





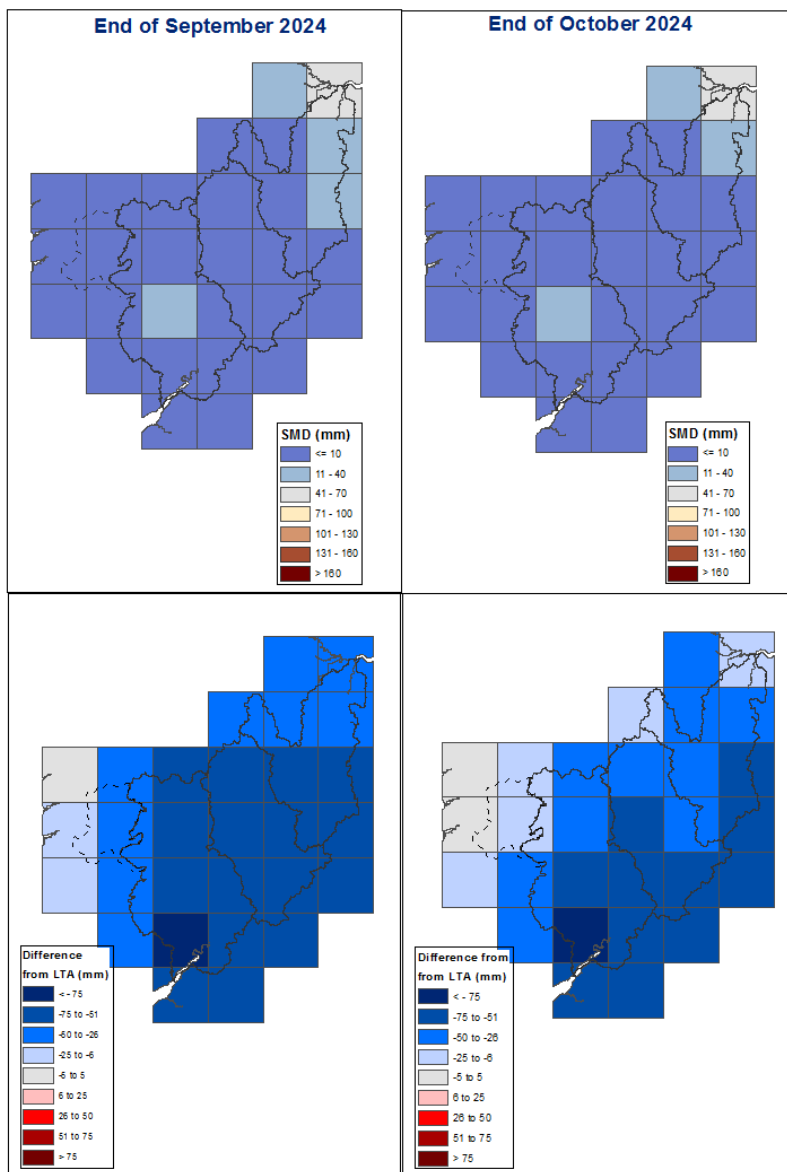


Daily Rainfall Tool data (from January 2023), final HadUK rainfall data until December 2022 (Source: Environment Agency/Met Office, Crown Copyright, 2024).

3 Soil moisture deficit

3.1 Soil moisture deficit map

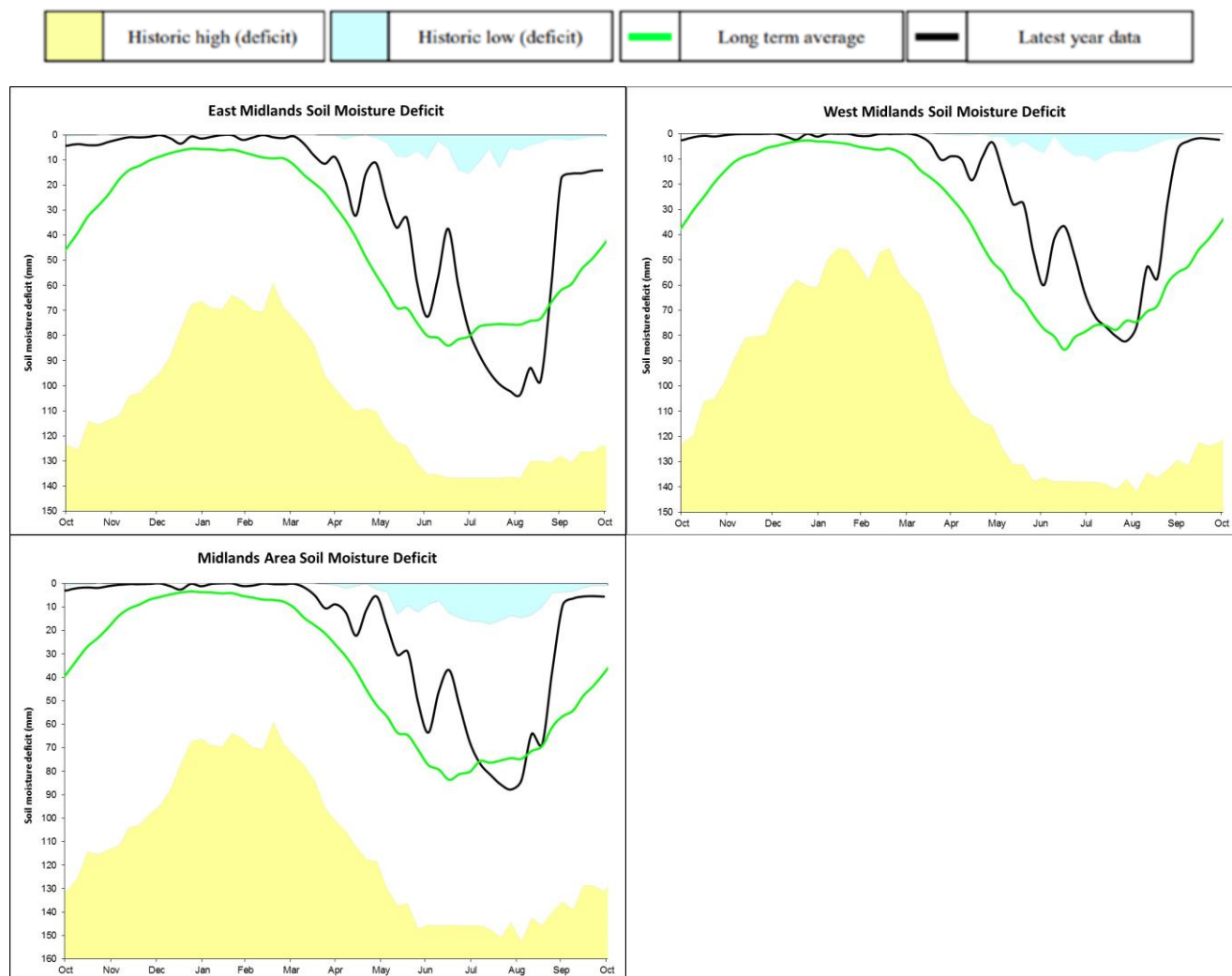
Figure 3.1: Soil moisture deficits for weeks ending 31 October 2024. Shows the difference (mm) of the actual soil moisture deficit from the 1961 to 1990 long term average soil moisture deficits. MORECS data for real land use.



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3.2 Soil moisture deficit charts

Figure 3.2: Latest soil moisture deficit charts for selected areas across the Midlands.

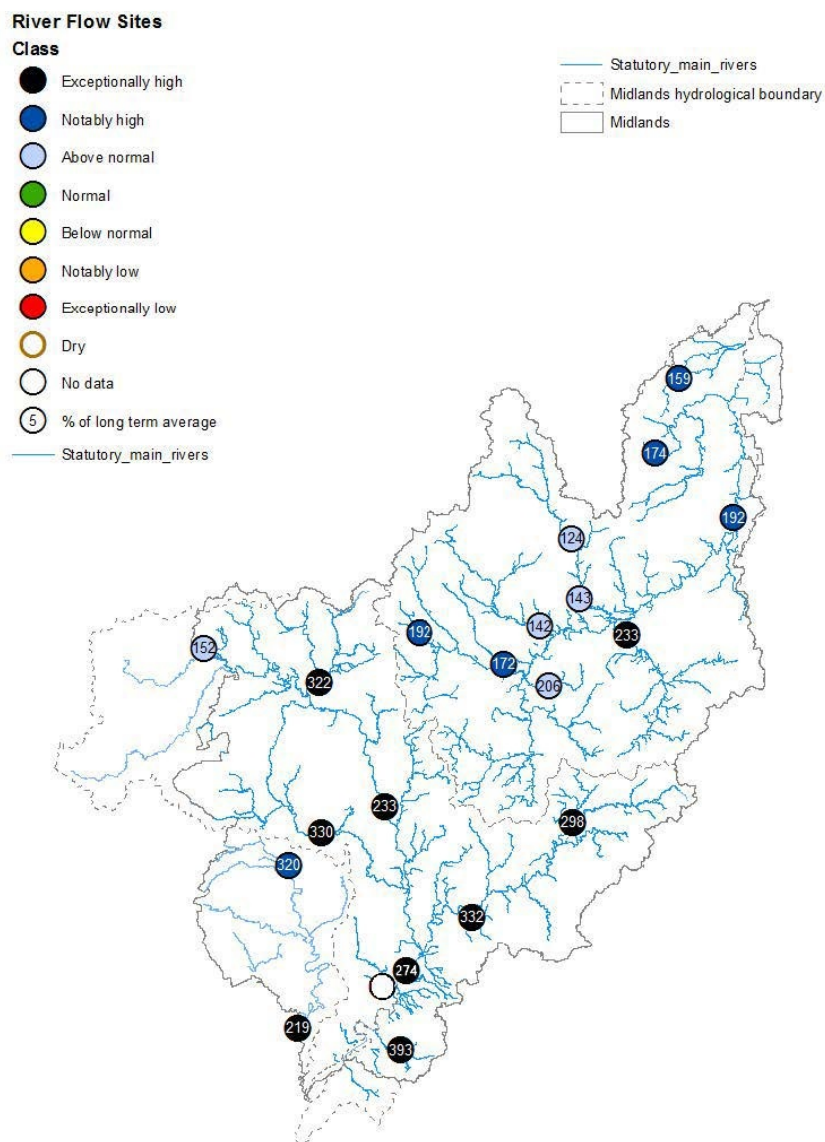


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4 River flows

4.1 River flows map

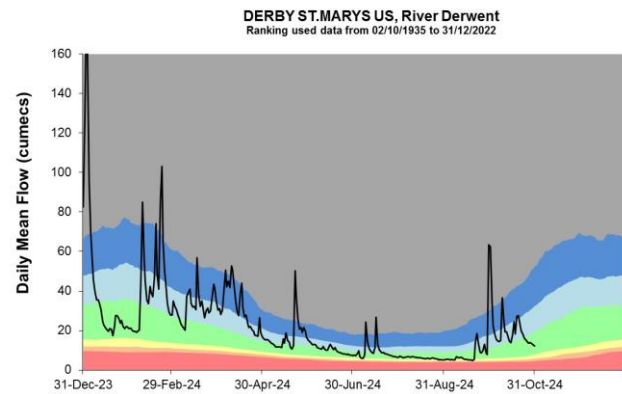
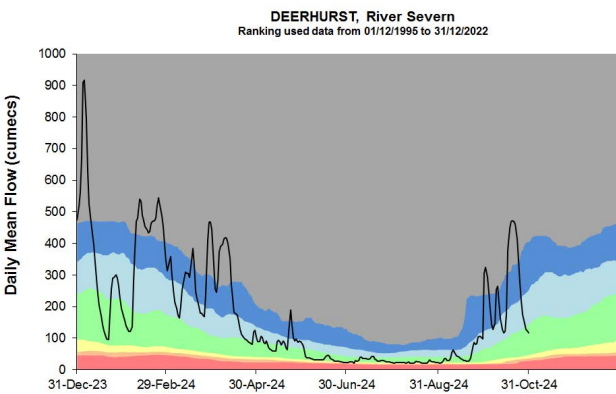
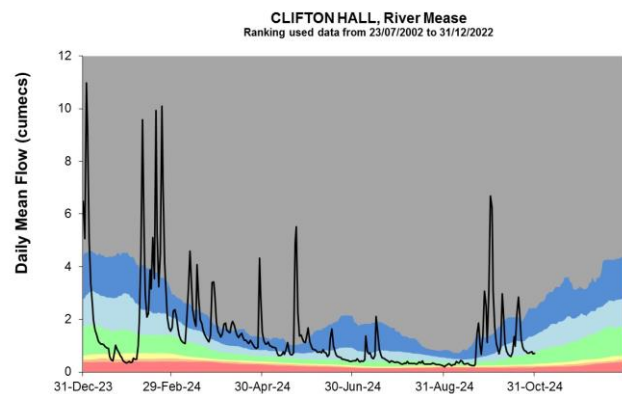
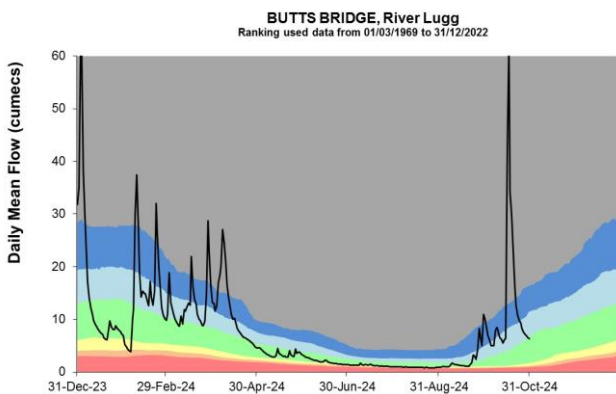
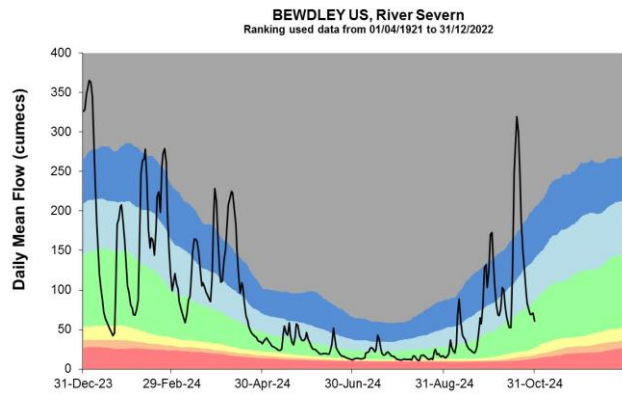
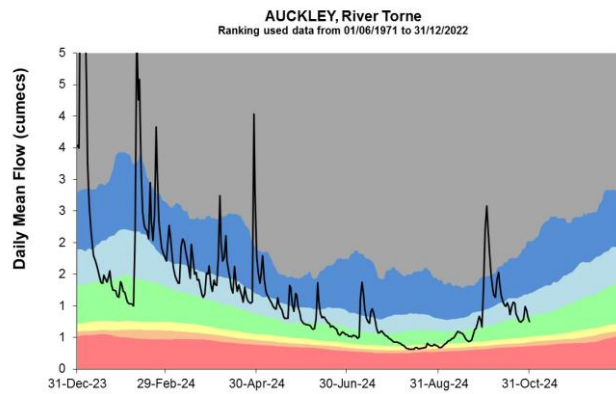
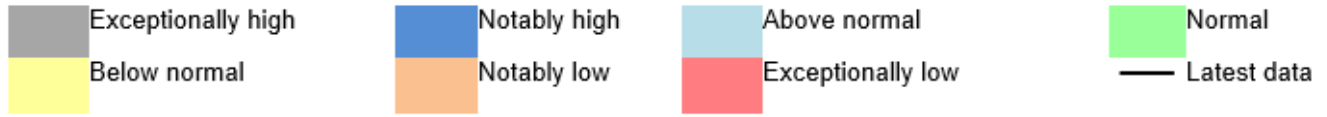
Figure 4.1: Monthly mean river flow for indicator sites for [October 2024], expressed as a percentage of the respective long term average and classed relative to an analysis of historic October monthly means. Table available in the appendices with detailed information.

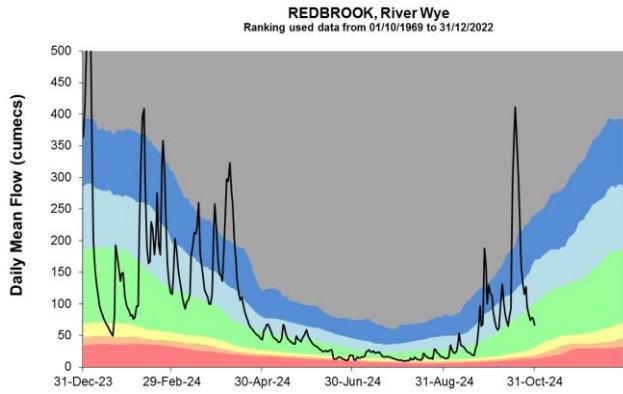
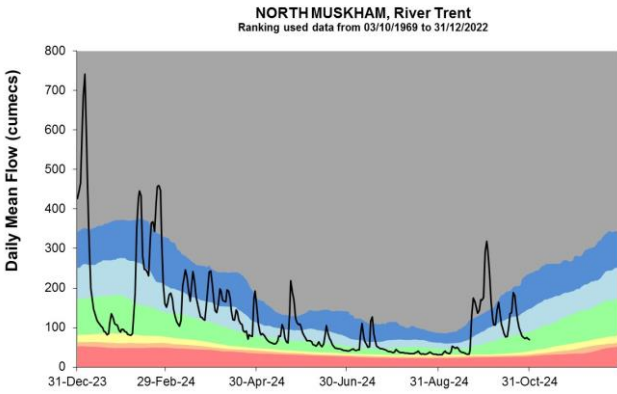
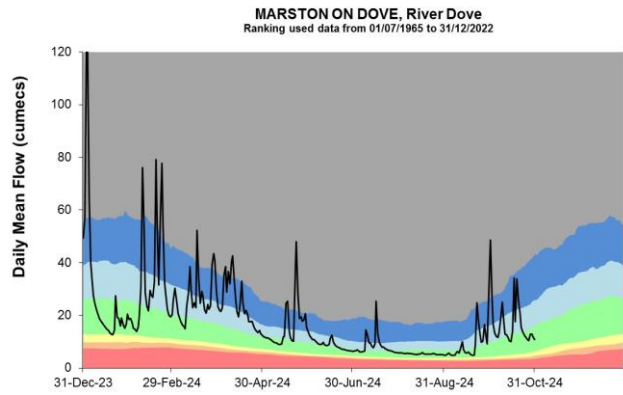
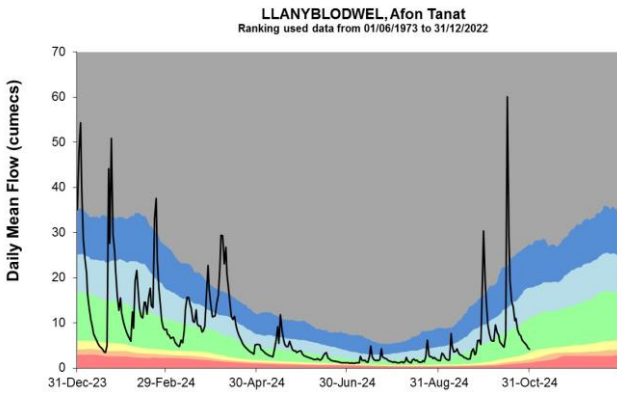
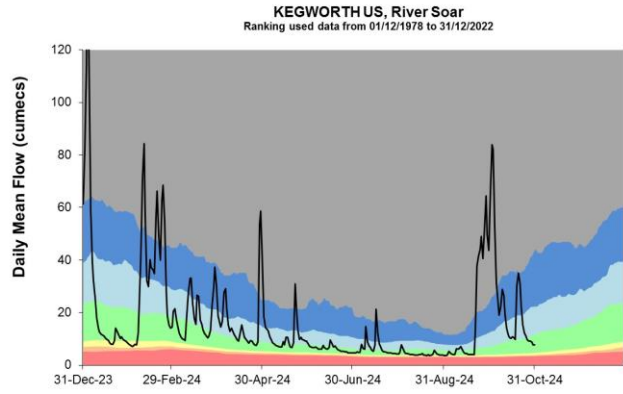
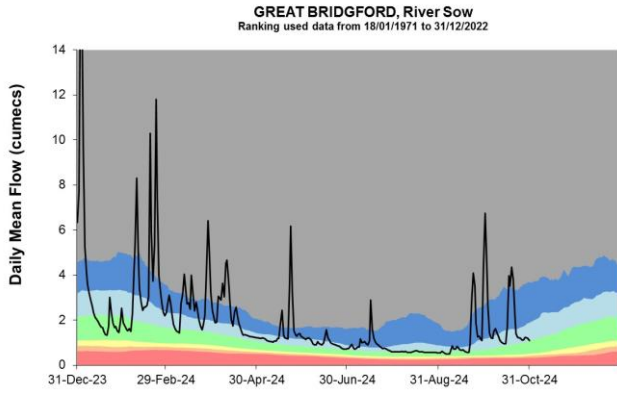
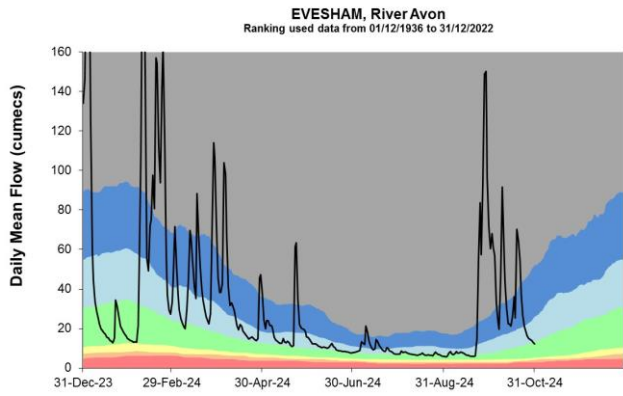
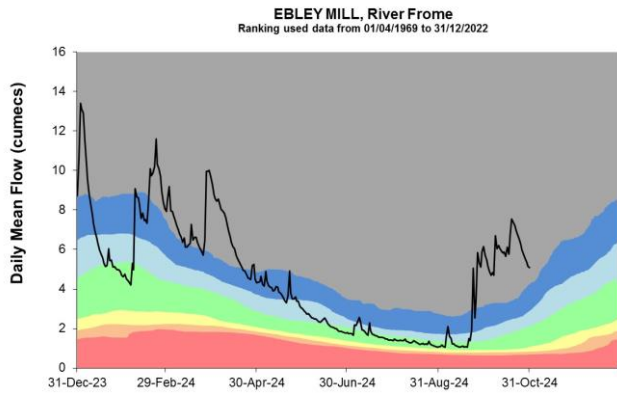


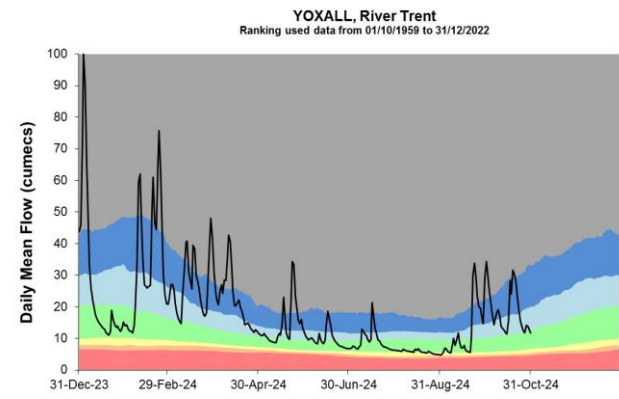
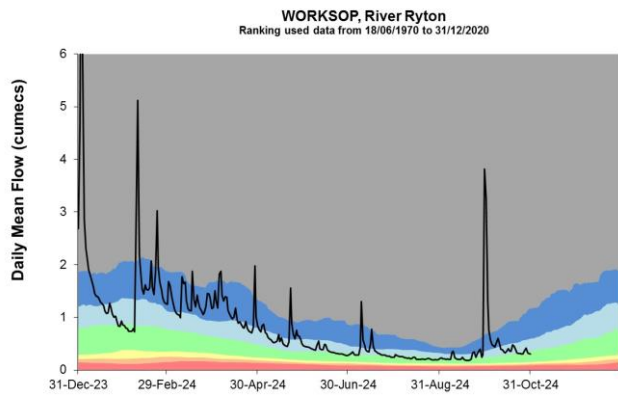
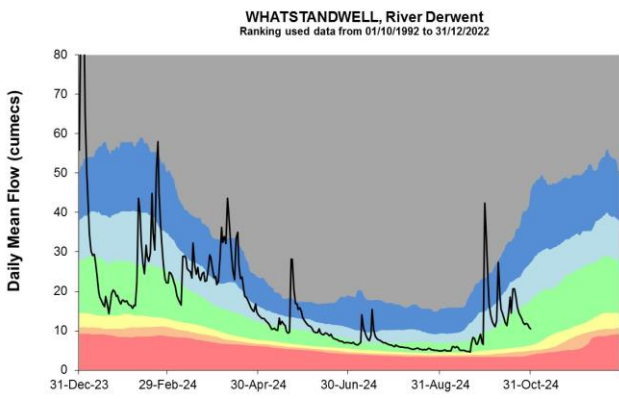
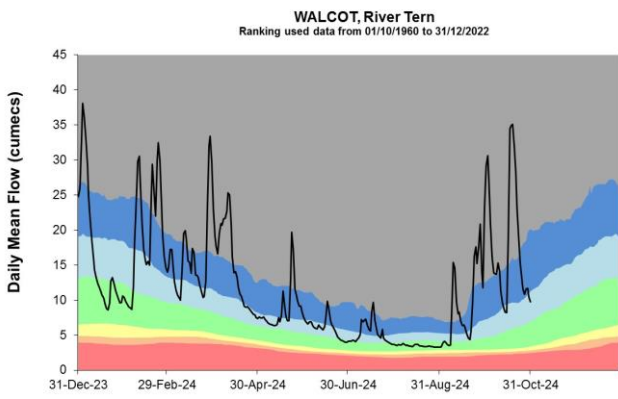
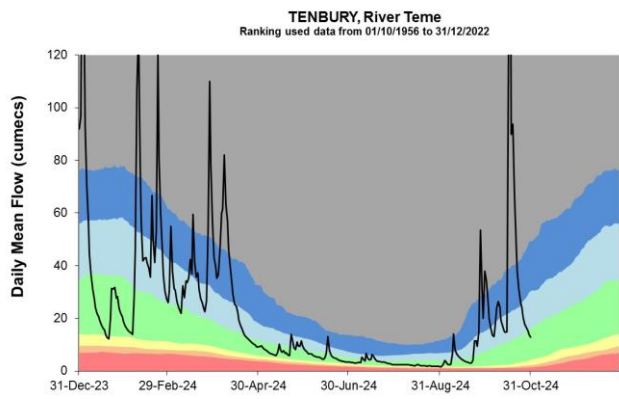
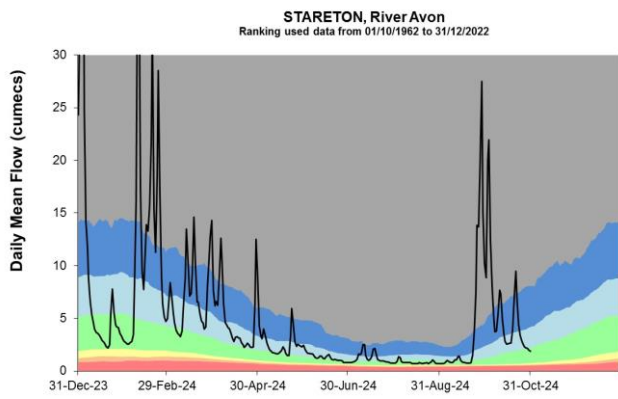
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

4.2 River flow charts

Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.





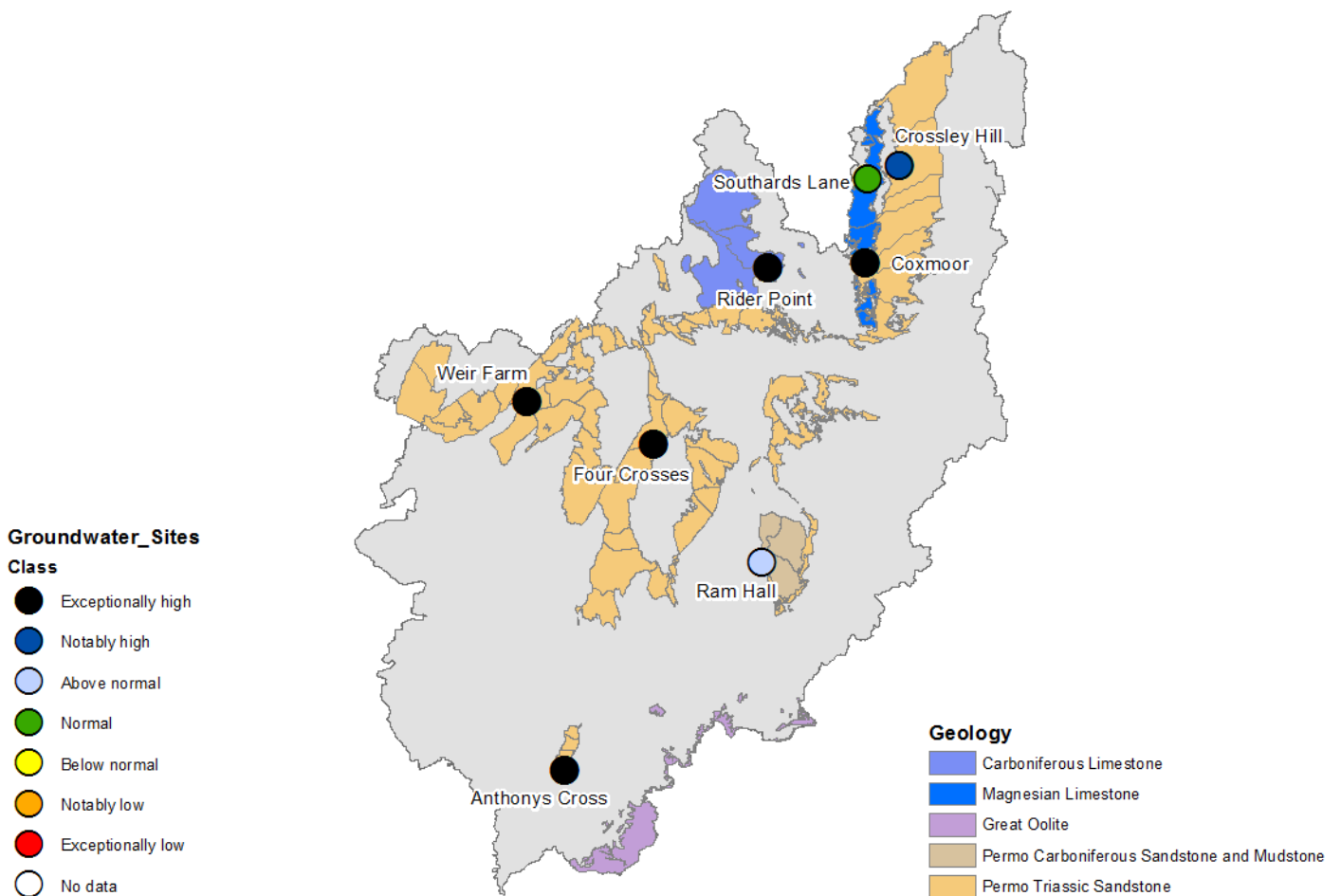


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

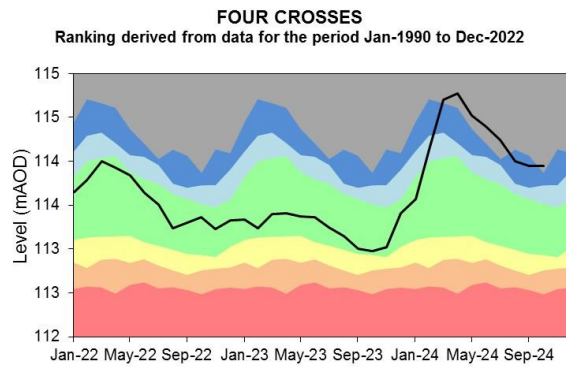
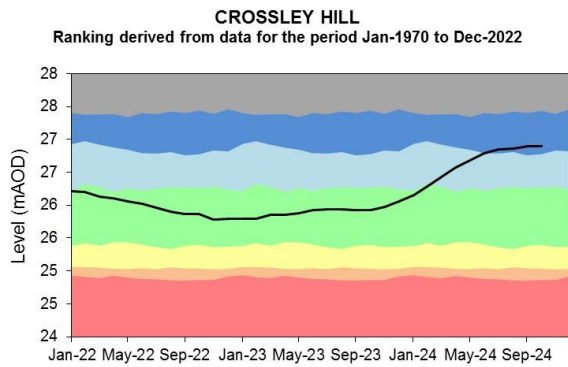
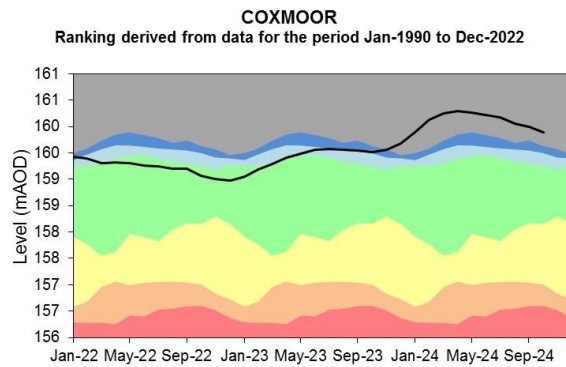
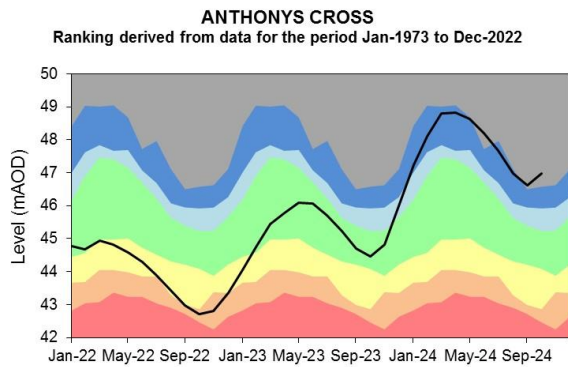
Figure 5.1: Groundwater levels for indicator sites at the end of [October 2024], classed relative to an analysis of respective historic October levels. Table available in the appendices with detailed information.

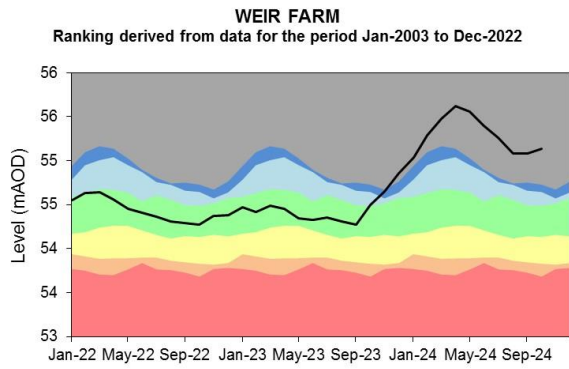
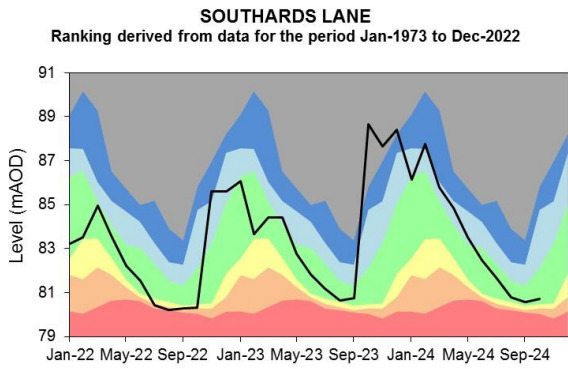
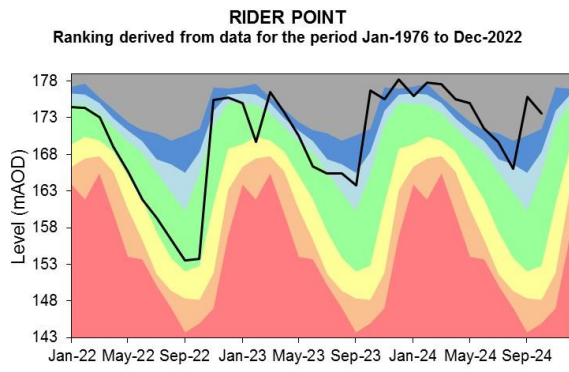
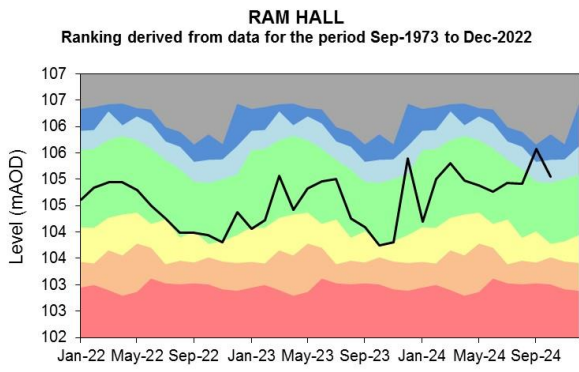


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5.2 Groundwater level charts

Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels.

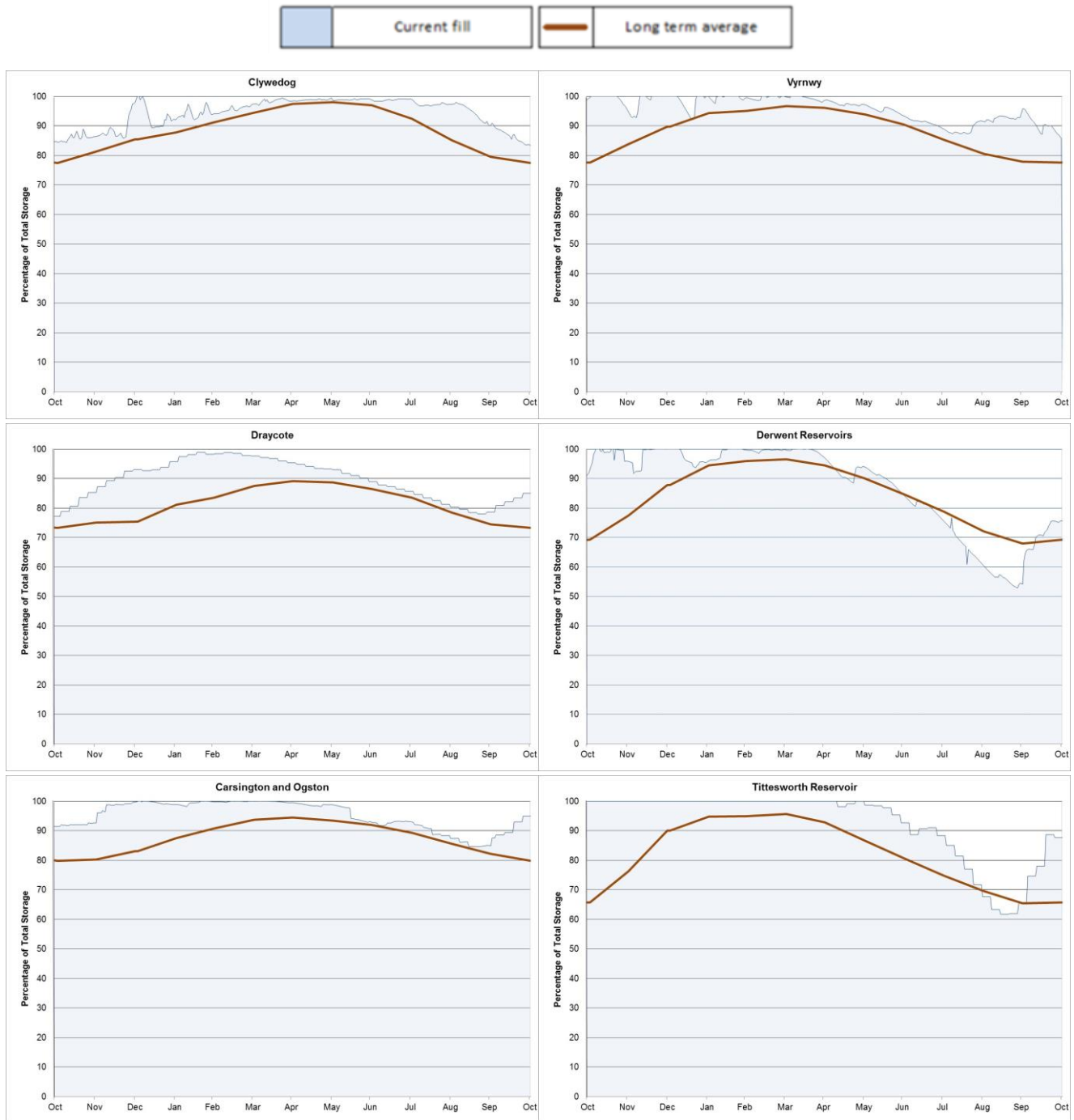


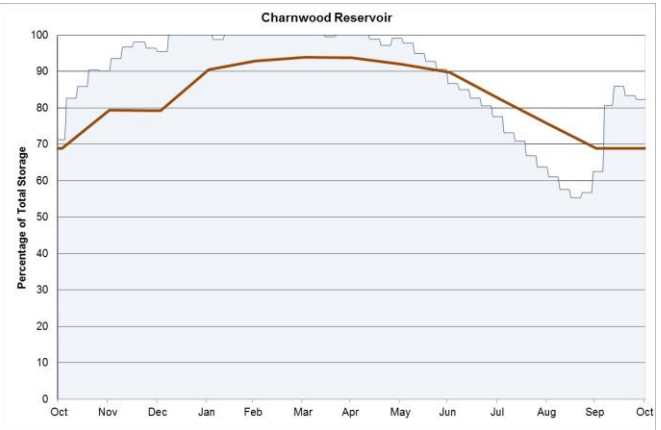
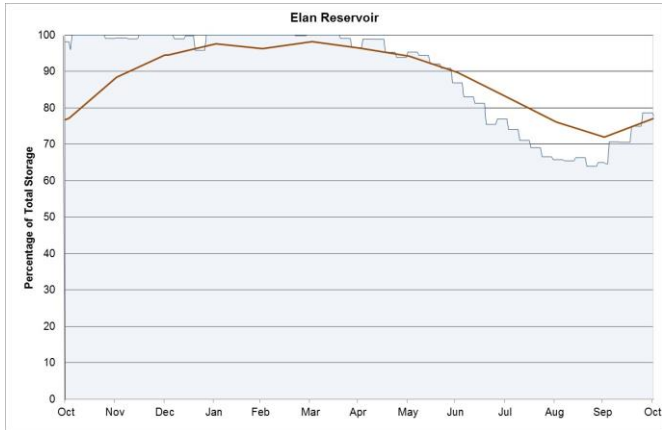
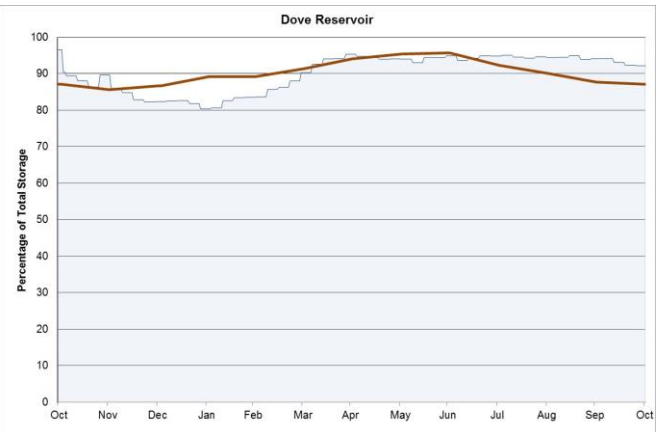
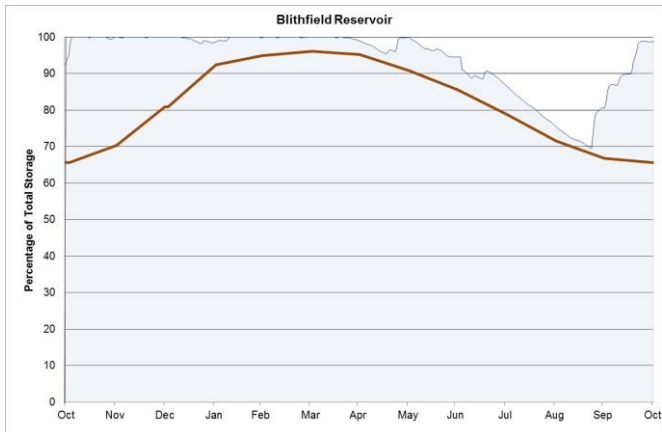


Source: Environment Agency, 2024.

6 Reservoir stocks

Figure 6.1: End of month regional reservoir stocks compared to long term average stocks. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length. Please see Section 7.5 for a map detailing the locality of the Midlands reservoirs reported on.





(Source: water companies).

7 Glossary

7.1 Terminology

Aquifer

A geological formation able to store and transmit water.

Areal average rainfall

The estimated average depth of rainfall over a defined area. Expressed in depth of water (mm).

Artesian

The condition where the groundwater level is above ground surface but is prevented from rising to this level by an overlying continuous low permeability layer, such as clay.

Artesian borehole

Borehole where the level of groundwater is above the top of the borehole and groundwater flows out of the borehole when unsealed.

Cumecs

Cubic metres per second (m^3s^{-1}).

Effective rainfall

The rainfall available to percolate into the soil or produce river flow. Expressed in depth of water (mm).

Flood alert and flood warning

Three levels of warnings may be issued by the Environment Agency. Flood alerts indicate flooding is possible. Flood warnings indicate flooding is expected. Severe flood warnings indicate severe flooding.

Groundwater

The water found in an aquifer.

Long term average (LTA)

The arithmetic mean calculated from the historic record, usually based on the period 1961 to 1990. However, the period used may vary by parameter being reported on (see figure captions for details).

mAOD

Metres above ordnance datum (mean sea level at Newlyn Cornwall).

MORECS

Met Office Rainfall and Evaporation Calculation System. Met Office service providing real time calculation of evapotranspiration, soil moisture deficit and effective rainfall on a 40 by 40 km grid.

Naturalised flow

River flow with the impacts of artificial influences removed. Artificial influences may include abstractions, discharges, transfers, augmentation and impoundments.

NCIC

National Climate Information Centre. NCIC area monthly rainfall totals are derived using the Met Office 5 km gridded dataset, which uses rain gauge observations.

Recharge

The process of increasing the water stored in the saturated zone of an aquifer. Expressed in depth of water (mm).

Reservoir gross capacity

The total capacity of a reservoir.

Reservoir live capacity

The capacity of the reservoir that is normally usable for storage to meet established reservoir operating requirements. This excludes any capacity not available for use (for example, storage held back for emergency services, operating agreements or physical restrictions). May also be referred to as 'net' or 'deployable' capacity.

Soil moisture deficit (SMD)

The difference between the amount of water actually in the soil and the amount of water the soil can hold. Expressed in depth of water (mm).

7.2 Categories

Exceptionally high

Value likely to fall within this band 5% of the time.

Notably high

Value likely to fall within this band 8% of the time.

Above normal

Value likely to fall within this band 15% of the time.

Normal

Value likely to fall within this band 44% of the time.

Below normal

Value likely to fall within this band 15% of the time.

Notably low

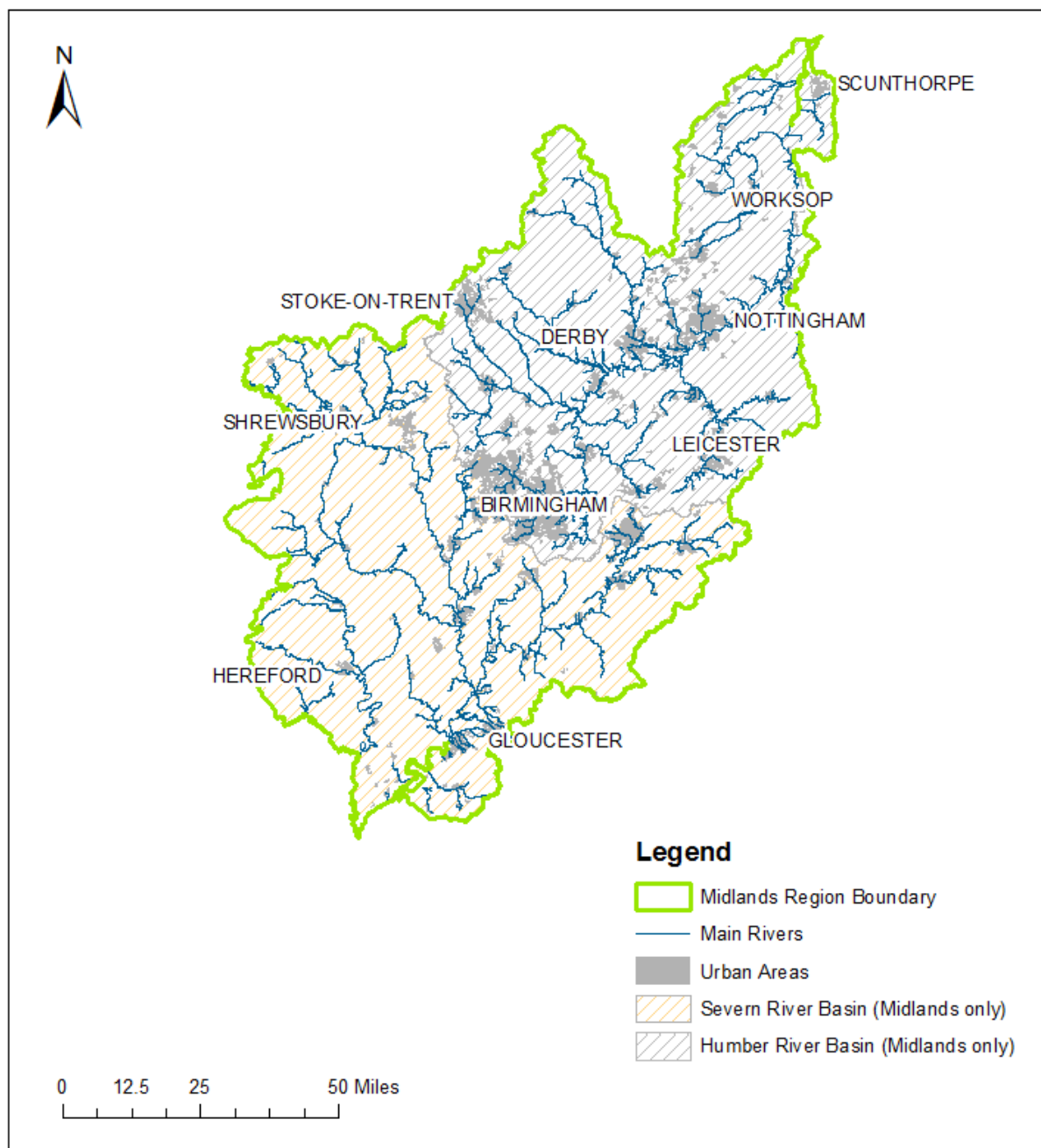
Value likely to fall within this band 8% of the time.

Exceptionally low

Value likely to fall within this band 5% of the time.

7.3 Midlands regional coverage

Figure 7.1: The Midlands regional boundary and the hydrological boundaries of the River Severn and River Trent.



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7.4 Midlands hydrological areas

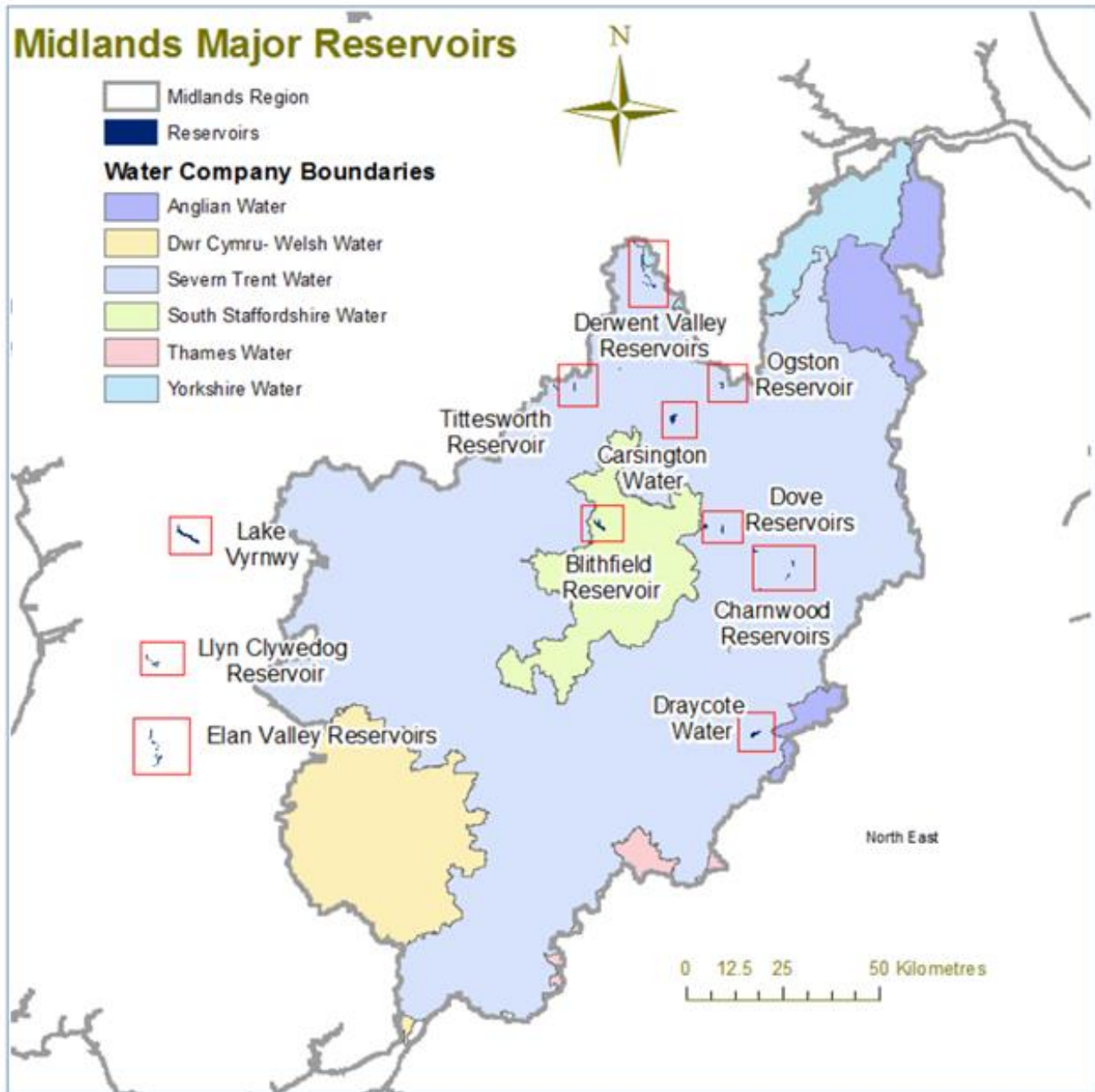
Figure 7.2: The 12 hydrological areas that make up the Midlands region. Natural Resources Wales are not currently producing a monthly water situation report.



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7.5 Midlands major reservoirs

Figure 7.3: Location of major reservoirs in the Midlands.



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8 Appendices

8.1 Rainfall table

Hydrological area	Oct 2024 rainfall % of long term average 1961 to 1990	Oct 2024 band	Aug 2024 to October cumulative band	May 2024 to October cumulative band	Nov 2023 to October cumulative band
Avon To Evesham	140	Normal	Notably high	Above normal	Exceptionally high
Derwent (midlands)	100	Normal	Normal	Normal	Exceptionally high
Dove	105	Normal	Normal	Normal	Exceptionally high
Lower Severn Estuary	165	Above Normal	Exceptionally high	Notably high	Exceptionally high
Lower Trent	124	Normal	Normal	Normal	Exceptionally high
Lower Wye	173	Above Normal	Exceptionally high	Above normal	Exceptionally high
Mid Severn	153	Above Normal	Above normal	Above normal	Exceptionally high
Shropshire Plains	145	Normal	Notably high	Notably high	Exceptionally high
Soar	128	Normal	Exceptionally high	Above normal	Exceptionally high

Tame	122	Normal	Above normal	Above normal	Exceptionally high
Upper Trent	116	Normal	Above normal	Above normal	Exceptionally high
Welsh Mountains	96	Normal	Normal	Normal	Exceptionally high

8.2 River flows table

Site name	River	Catchment	Oct 2024 band	Sep 2024 band
Auckley	Torne	Torne	Notably high	Normal
Bewdley	Severn	Severn Lower Mid	Exceptionally high	Above normal
Butts Bridge	Lugg	Lugg	Notably high	Above normal
Clifton Hall	River Mease	Mease	Above normal	Above normal
Deerhurst	Severn	Severn Lower	Exceptionally high	Above normal
Derby St Marys	Derwent	Derwent Der to Markeaton con	Above normal	Normal
Ebley Mill	Frome (glos)	Frome Gloucs	Exceptionally high	Notably high
Evesham	Avon (mi)	Avon Warwks Lower	Exceptionally high	Exceptionally high
Great Bridgford	Sow	Sow Upper	Notably high	Notably high
Kegworth	Soar	Soar to Kingston Brook confl	Exceptionally high	Exceptionally high
Llanyblodwel	Tanat	Severn Upper River Tanat	Above normal	Above normal
Marston On Dove	Dove (mi)	Dove Derb to Hilton Br confl	Above normal	Above normal

North Muskham	Trent	Trent to Cromwell	Notably high	Notably high
Stareton	Avon (mi)	Avon Warwks Upper	Exceptionally high	Exceptionally high
Tenbury	Teme	Teme	Exceptionally high	Above normal
Walcot	Tern	Tern	Exceptionally high	Exceptionally high
Wedderburn Bridge	Leadon	Leadon	Exceptionally high	Exceptionally high
Whatstandwell	Derwent	Derwent Derb to Amber conf	Above normal	Normal
Worksop	Ryton	Ryton Upper to Oldcoates Dyke	Notably high	Notably high
Yoxall	Trent	Trent to Tame Mease confl	Notably high	Above normal
Redbrook	Wye (herefordshire)	Wye H and W d s Lugg	Exceptionally high	Above normal

8.3 Groundwater table

Site name	Aquifer	End of Oct 2024 band	End of Sep 2024 band
Coxmoor	Permo Triassic Sandstone	Exceptionally high	Exceptionally high
Crossley Hill	Permo Triassic Sandstone	Notably high	Notably high
Four Crosses	Grimsby Ancholme Louth Limestone	Exceptionally high	Notably high
Ram Hall, Meriden	Grimsby Ancholme Louth Limestone	Above normal	Notably high
Rider Point Via Gellia	Carboniferous Limestone	Exceptionally high	Exceptionally high
Southards Lane, Bolsover	Magnesian Limestone	Normal	Normal
Weir Farm	Bridgnorth Sandstone Formation	Exceptionally high	Exceptionally high